DRAFT
PROPERTY DEVELOPMENT DECISION DOCUMENT (PDDD)

SMARTHOUSE WAY SOUTH TRACT BROWNFIELDS SITE
100 Smarthouse Way
North Little Rock, Arkansas 72114
Pulaski County

AFIN: 60-02397

1. INTRODUCTION.

On March 17, 2004, Main Street Argenta (hereafter "MSA") submitted a Notice of Intent to Purchase and requested retention of eligibility to participate in the Arkansas Brownfields Program for the Smarthouse Way property (hereafter "the Property") located at 100 Smarthouse Way in North Little Rock, Pulaski County, Arkansas. The Arkansas Department of Environmental Quality (hereafter "ADEQ") acknowledged and accepted the site's eligibility for participation in the Brownfields Program in a letter dated March 29, 2004. The ADEQ and MSA subsequently entered into an Implementing Agreement, LIS # 06-092, which became effective on June 22, 2006.

This draft Property Development Decision Document (PDDD) is promulgated as part of the Brownfields Implementing Agreement (IA), Legal Information System (LIS) No. 06-092, executed between MSA and ADEQ. The PDDD outlines the selected remedy for the property based upon the MSA declared redevelopment and future use of the property. This PDDD is incorporated into and becomes a condition of the Brownfields Implementing Agreement between MSA and the ADEQ.

In this draft PDDD, ADEQ describes a proposed final remedy for the Smarthouse Way South Tract Brownfields site (Site) and provides the reasoning for this preference. In addition, this draft PDDD includes summaries of other alternatives evaluated for use at this Site. ADEQ will select a remedy for the Site after reviewing and considering all information submitted during the 30-day public comment period. ADEQ may modify the proposed alternative or select another remedial action presented in this proposed decision based on new information or public comments on this draft PDDD. Therefore, the public is encouraged to review and comment on all of the alternatives presented in this draft PDDD. The Comprehensive Site Assessment (CSA) and Property Development Plan (PDP) for the Smarthouse South Tract site, available in the Administrative Record for this Decision, contain additional detailed information on these alternatives.

Brownfields Cleanup Revolving Loan Draft Decision.
On May 3, 2006, MSA made application to the ADEQ for a cleanup loan in the amount of $500,000 from the Arkansas Brownfields Cleanup Revolving Loan Fund (Arkansas BCRLF). Following review of this application by the ADEQ and the Arkansas Development Finance Authority (ADFA), the ADEQ proposes to approve a loan from the Arkansas BCRLF in the amount of $500,000, at an interest rate of 3.00% and a term of ten years.

Pursuant to BCRLF Cooperative Agreement between the ADEQ and the U.S. Environmental Protection Agency, Region 6, (EPA), the ADEQ, on behalf of MSA, conducted an Environmental Engineering/Cost Analysis (EE/CA) of options for a non-time critical removal action at the Smarthouse Way Brownfields. Based on the ADEQ's review, the Smarthouse Way Brownfields Site meets the federal National Contingency Plan (NCP) criteria for qualification for a removal action and ADEQ further believes the proposed removal action alternative should be the selected alternative. It is recommended that the selected response – a non-time critical removal consisting of excavation, stabilization, and off-site reuse and/or disposal of contaminated soils be implemented, and that the response be conducted under the oversight of the Site Manager.

This draft decision is made in coordination with the proposal of a selected remedy for the Smarthouse Way Brownfields site, and this draft PDDD constitutes the Engineering Estimate/Cost Analysis and the Decision Document required under the conditions of ADEQ's Cooperative Agreement No. BL-976244-01 with U.S. EPA Region 6 for the administration of the BCRLF.

Community Participation

ADEQ is issuing this draft PDDD as part of its public participation responsibilities under section 8-7-1103(h)(1) of the Arkansas Voluntary Cleanup Act (A.C.A. §§ 8-7-1101, et seq.) This draft PDDD summarizes information that can be found in greater detail in the Comprehensive Site Assessment (CSA), PDP and other documents contained in the Administrative Record file for this Site. ADEQ encourages the public to review these documents to gain a more comprehensive understanding of the Site and the Brownfields activities conducted at the Site.

The Administrative Record file, which contains the information on which the selection of the final response action will be based, is available at the following locations:

Arkansas Department of Environmental Quality
Records Management Repository
1 State Police Plaza
Little Rock, AR 72209
(501) 682-0007

The public is invited to comment on the Administrative Record and draft PDDD for the Site. The public comment period begins on September 14, 2006 and ends on October 13, 2006. During the public comment period, written comments may be submitted to:

J. Ryan Benefield, P.E.
Chief, ADEQ Hazardous Waste Division
8001 National Drive
Little Rock, AR 72219-8913

Pursuant to APC&EC Regulation No. 8 (Administrative Procedures) § 2.1.5, if any person wishes to request a public hearing on the draft PDDD or the proposed BCRLF award, he or she may do so by making such request in writing and stating the reason(s) for his or her request for a public hearing on these matters. This request must be submitted to the ADEQ within ten (10) business days of the initial date of this public notice (e.g., before 4:30 p.m. on September 25, 2006). ADEQ shall have discretion whether to hold a public hearing prior to the Director's final decision.

ADEQ will respond to all comments on this draft PDDD received during the public comment period in a document called a Response to Comments. The Response to Comments will be attached to the final PDDD for this Site and made available to the public in the information repositories. The PDDD explains the remedial action(s) selected for use at this Site. The remedy may be different from the preferred alternative identified in this draft PDDD based on comments, new information, or issues received during the public comment period. Any aspects of the proposed action that are significantly different from the draft PDDD will be explained in the final PDDD. The final PDDD will be signed by the Director of the Arkansas Department of Environmental Quality.

Information about the public involvement process and answers to questions about activities at the Site can be obtained from the following individuals:

Terry Sligh
Arkansas Department of Environmental Quality
8001 National Drive
Little Rock, AR 72219-8913
(501) 682-0853
terry@adeq.state.ar.us

Media inquiries should be directed to Ms. Kelly Robinson, ADEQ Public Affairs Officer, at (501) 682-0916.

2. SITE BACKGROUND

The Smarthouse Way property consists of a North and South Tract. The South Tract (site) is the subject of this draft PDDD. As a result of the stated land use for the redevelopment of the site, the EPA Region 6 Residential Human Health Medium Soil Screening Levels (HHMSSL) for residential land use has been adopted as the cleanup standard for the site.

The property has previously shown evidence of environmental impact to soils as a result of historical site usage. The property was partially used for residential purposes in the past, but has also been occupied by several industrial operations, some dating back to the late 1800's (Land Recycling Company, Phase I ESA – October, 2004). Previous occupants of the southern tract included a scrap paper company, a scrap metal company and associated junk yard, a steel manufacturing company, and railroad lines. The property has been vacant since the 1960's.

The site contains approximately 5.8 acres and is located at the southeast intersection of Riverfront Drive and Karrott Street in North Little Rock (Pulaski County), Arkansas. The MSA intended use of the Property is to develop it as mixed use high-rise condominiums and retail/office space. The rest of the site would subsequently be covered by parking lots, and landscaped areas.

History of Operations

Historic land uses for the site included residential single family housing as well as various light industrial uses dating to the late 1800's. According to historic Sanborn Fire Insurance Maps for the site (Land Recycling Company, Phase I ESA – October, 2004), in 1886 the site was occupied by Little Rock Cooperage Company, a manufacturer of oak cottonseed oil barrels. Numerous outbuildings, scattered lumber, stave piles, and possible storage tank features were also identified.

In 1913, the site was occupied by a stave company (W.W. Wilson & Wripe Stave Co.) and possibly a storage tank. Maps from the period also indicate the presence of a stave mill, steam dry kilns, and a sawdust bin.

In 1939, the south tract was partially developed for residential use. Jordan Lumber Company and a large circular structure labeled "waste" appear on maps of the period. Additionally, an asphalt plant and asphalt tank were located on the western portion of the property.

In 1950, residential developments were no longer visible, nor were the features of the former lumber company. The 1954 USGS topographic map of the site indicates that railroad spurs were present on the western portion of the site or directly adjoining the site.

The 1963 Sanborn Map indicates that the site was occupied by a scrap paper company, scrap metal company/junk yard, office buildings, and several structures.

Ownership

According to the Land Recycling Company (LRC) Phase I ESA report, real estate and tax assessor records do not indicate a clear ownership history for the site. The report states that a portion of the site may have been owned by Coulson Oil Company and prior to that the American Oil Company.

The City of North Little Rock purchased the property in 1990.

MSA purchased the property in September 2005.

Site Location and Description

The site is bordered to the east by the Broadway Street Bridge and to the north by Riverfront Drive. To the west, the site is partially bordered by Karrott Drive. A flood control retaining wall borders the site to the south, followed by a recreation-related walkway extending some 7 miles west and parallel to the Arkansas River.

The site is located in an urban area with mixed residential, commercial and some industrial use. The site is at an elevation of approximately 352 feet mean sea level. Storm water runoff generally flows north to storm water drains located along Riverfront Drive. There was indication that the site was an old dump site. The site currently consists of a vacant lot containing grass, trees, metal scraps, glass, small metal parts, gaskets, wire, rubber, rebar, some soil mounds with concrete and metal debris.

Overhead Entergy Corporation power lines trend east to west across the central portion of the property (Entergy maintains an 80 foot wide utility easement which runs the length of the site. Additionally, there is a lattice tower and two (2) "H" towers extant on the site which supports the electric transmission lines).

In addition to the debris at the surface, it has been noted during drilling investigation activities that several areas across the site also contained significant amount of buried concrete, asphalt, masonry brick and other solid waste.

Physical Setting

Soils along the northern bank of the Arkansas River in Pulaski County in the vicinity of Little Rock are classified as the Bruno-Crevasse association consisting of excessively drained, level to nearly level,

deep, loamy and sandy soils that formed on young natural levees of the Arkansas River. These soils formed in stratified loamy sediments carried from the west by the Arkansas River (*USGS Comprehensive Site Assessment – 2004*). The soils in the vicinity of the site consist of the Bruno-urban land complex being Bruno soils along the Arkansas River modified by urban development.

The site is located on the western edge of the Mississippi Alluvial Plain, a broad, flat area that is part of the Mississippi Embayment that covers most of eastern Arkansas. The Mississippi Embayment is a large system of sedimentary deposits extending southward in a fan shaped geosyncline from Illinois to the Gulf of Mexico. Within the Mississippi Embayment is the Mississippi River Valley alluvial aquifer (alluvial aquifer), the uppermost aquifer system found within the Mississippi Embayment in eastern Arkansas. The alluvial aquifer in eastern Arkansas consists of a sequence of unconsolidated sand, silt, and clay units that are bounded on the west by consolidated formations of lower permeability and on the east by the Mississippi River. From a regional perspective these sediments can be divided into two units. The upper unit is a sequence of clay, silt, and fine sand, which confines the aquifer in some places. The lower unit, which contains the alluvial aquifer, consists of coarse sand and gravel, which grades upward to fine sand.

A Limited Site Assessment was conducted on the Smarthouse Way Northern Tract (approximately 900 feet north of the site) by Pollution Management Inc. (PMI) in August 2004. Based on the PMI report and previous investigations conducted at the site, shallow perched groundwater can be encountered at depths ranging from 7 to 10 feet below ground surface (bgs). However, the perched water zone is not continuous and is dependent upon seasonal variations. Groundwater within the uppermost aquifer in the vicinity of the site occurs at a depth of approximately 20 feet bgs (PMI – 2004). Static groundwater levels in wells installed on the Smarthouse Way Northern Tract (and an adjacent service station) ranged from approximately 13 to 21 feet bgs.

Previous Investigations

Various site investigations have previously been conducted at the site. For details of these investigations, refer to the Comprehensive Site Assessment and the PDP, found in the Administrative Record for the Smarthouse Way site.

3. SUMMARY OF SITE RISKS

A Site-Specific Risk Determination (SRD) was completed by ADEQ in April 2005 to complete the Comprehensive Site Assessment (CSA). This SRD qualitatively reviewed all current and future potential risks to human health and the environment using the maximum concentrations found on-site (reported in the CSA). This SRD determined all but one of the constituents sampled met the EPA Region 6 HHMSSL or the ADEQ screening criteria for residential use, and thus no further risk-based remedial goals were warranted. One sample containing high levels of Total Petroleum Hydrocarbons (TPH) and Diesel Range Organics (DRO) was found at a depth of two feet on the South site (S2-W-48), which could be eliminated with the intended site-wide removal of the top two to four feet of soil which MSA proposed.

A. HUMAN HEALTH RISKS

Chemicals of Concern

The primary chemicals of concern (COCs) at the Smarthouse Way site are chemicals associated with industrial and commercial operations conducted at the site. These chemicals include: lead, cadmium, benzo(a)pyrene, polychlorinated biphenyls (PCBs), and diesel-range petroleum-based hydrocarbons (TPH-DRO).

Land and Ground Water Use Assumptions

The area surrounding the Smarthouse Way site is occupied by commercial office buildings to the north and west, with a bridge to the immediate east and a recreational trail and the Arkansas River to the immediate south. Low and moderate income residential housing areas are located approximately one quarter mile to the north and west. The site is intended for mixed residential and commercial development in the near future, with a strong emphasis on residential use. It was determined that residents within a 4-mile radius of the site are utilizing public drinking water obtained via pipelines from the City of North Little Rock, Arkansas. No wells used for drinking water were found.

The site is currently vacant and not utilized for any private or public recreational activities. It appears that the property has remained in its current state for at least the last 30 years and it is not anticipated that any changes in surface conditions will occur pending cleanup actions. In May, 2006 MSA erected plastic fencing around the property and placed signs at the construction entrance stating that public access to the property was prohibited.

Potentially Exposed Populations and Exposure Pathways

An exposure assessment was conducted as part of the risk assessment evaluation. The exposure assessment consisted of characterizing the most conservative potentially exposed receptors (i.e., resident adult, resident child, on-site visitor, and construction worker), identifying complete exposure pathways, and qualitatively identifying exposure. An exposure pathway usually includes the following: (1) a source and means of contaminant release; (2) a transport medium (e.g., air, ground water, etc.); (3) a point of contact with the medium (i.e., receptor); and (4) an intake route (e.g., inhalation, ingestion, or dermal contact). Complete exposure pathways examined in the risk assessment evaluation were a future on-site resident (adult and child) exposed to surface soil, drainage pathway soils and ground water, a future construction worker exposed to subsurface soil and ground water, and a visitor exposed to surface soil.

Estimated Cancer and Non-cancer Risks

The final step of the risk assessment process is called risk characterization. Risk characterization combines the exposure assessment with the toxicity assessment. The toxicity assessment evaluates the relationship between a dose of a chemical and the predicted occurrence of an adverse health effect. In the risk assessment, toxic effects are separated into two categories: cancer effects and non-cancer effects. For non-cancer effects, the risk is expressed as a hazard index (HI). An HI greater than 1 indicates a potential for adverse effects. Potential cancer effects are characterized in terms of the excess chance of an individual developing cancer over a lifetime as a result of exposure to a potential carcinogen. An excess cancer risk of 1×10^{-6} (one in 1,000,000) is used by EPA as a starting point for determining remediation goals. Acceptable exposure levels for carcinogens are generally at concentrations that represent an excess cancer risk of between 1×10^{-4} (one in 10,000) and 1×10^{-6} (one in 1,000,000). The hazards and/or cancer risk presented in the risk characterization should be viewed along with uncertainties that exist in the data, assumptions, methods and endpoints that are being studied.

With the proposed removal of all surface and subsurface soil contamination that exceeds the EPA Region 6 HHMSSL (set at 1 x 10^{-6} or an HQ of 1) and ADEQ screening criteria for TPH, conditions at the site at the conclusion of the remedial action are anticipated to be suitable for unrestricted use and unrestricted exposure to any remaining on-site constituents.

Groundwater samples at the site indicated four constituents which exceeded the federal Maximum Contaminant Level (MCL) drinking water standards: iron, lead, methylene chloride, and vanadium. Surveys conducted during the CSA indicate that this aquifer is not used as a source for drinking water. MSA has agreed to a restriction on the pumping or use of groundwater at this site as a component of the selected remedy in order to ensure that this potential exposure pathway remains incomplete.

B. ECOLOGICAL RISKS

Potential risks to ecological receptors were also evaluated in the risk assessment. Little or no habitat is provided on the main portion of the site due to the open field nature of the property. The site-specific Screening Level Ecological Risk Assessment (SLERA) evaluated a number of terrestrial receptors to identify adverse impacts for site-related COCs. Based on results from the SLERA , no residual (post-removal) risks remain for ecological receptors at the Smarthouse Way site. Therefore, no further ecological risk-based action is warranted.

It is the ADEQ's current judgment that the preferred alternative identified in this draft PDDD or one of the other active measures considered in the draft PDDD is necessary to protect public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

4. SUMMARY OF REMEDIAL APPROACH

ADEQ's Voluntary Cleanup Program (hereafter "VCP") is a streamlined, performance-based cleanup process by which a facility (or the Brownfields Participant) and the ADEQ determine whether a release of hazardous substances must be addressed through remedial action and whether the actions taken to address said release are protective of human health and the environment. The three performance standards of the VCP are source control, applicable statutory and regulatory requirements, and final risk goal. The final risk goal must ensure that no unacceptable risks to human health or the environment remain at the site at the conclusion of remedial activities. A remedy's cleanup standards can fall within the range of $1x10^{-4}$ to $1x10^{-6}$ excess lifetime risk from exposure to a carcinogenic hazardous constituent, and a hazard quotient of 1.0 for non-carcinogens. The final risk goal performance standard developed through the VCP will generally fall within that range as well. The source control and statutory and regulatory requirement performance standards will determine the need for and degree of any necessary remedial actions.

Scope and Role of Response Action: There is only one planned operable unit for the site, and the actions proposed in this draft PDDD are intended to address all areas of concern at the site. The proposed scope of the remedial action is to remove primary sources of lead and other contaminants of concern which exceed health-based screening levels that allow unrestricted use or unrestricted exposure to any constituent remaining on-site.

5. SUMMARY OF ALTERNATIVES CONSIDERED IN FEASIBILITY STUDY (FS)

The types of contaminants identified at the site include both organic and inorganic compounds. The selected remedy must be able to meet the desired cleanup goals and redevelopment requirements for all the contaminants identified at the site; therefore, a combination of the remedial technologies was also considered.

Ten remedial alternatives were evaluated based on the effectiveness and other concerns such as economic feasibility and time. The estimated capital cost is based on information presented in the PDP. It is estimated that at a minimum 32,505 tons of material will be removed from the site. Adding water to excavated soil for dust control can increase the weight of the material. Other factors that can affect the weight or volume of excavated material include caving of sidewalls during excavation, ability of the contractor to remove materials to the prescribed depths, weather events and areas of additional contamination not previously identified. Thus, the actual cost of remediation can vary. The costs for consulting/oversight, construction of a parking lot, landscaping and any annual O&M are part of the future developmental costs, thus, they are not evaluated in this remedial costs estimate.

Alternative 1: No Action

Estimated Capital Cost: $0
Estimated Annual O&M Costs: $0

The federal NCP, 40 C.F.R. § 300.430(e)(6) requires that the "No Action" alternative be evaluated at every Site to establish a baseline for comparison. Under this alternative, MSA would take No Action at the Site to prevent exposure to the contaminants at the site.

If No Action is taken, contaminants exceeding residential HHMSSL will remain in the soil. There will be minimal or no cost involved. However, this is not a viable option based on the intended land use for the property redevelopment.

Alternative 2. Isolation/Containment

Estimated Capital Cost: $504,274
Estimated Annual Operation and Maintenance (O&M) Costs: Not evaluated.

Isolation/Containment for this site involves using a geo-membrane and cap by 3 feet of clean backfill and concrete or asphalt parking lot over the entire property. Contaminants on the property would not be removed, but isolated from the environment and contained in place by the cap.

This alternative does not suit MSA's redevelopment plan for future construction on the site. The construction of a parking lot would not utilize the full potential economic value of the property. This alternative does not reduce contaminant concentrations and leave waste exceeding HHMSSL on site.

Alternative 3. Waste Excavation, Characterization and Subsequent Landfill Disposal

Estimated Capital Cost: $ 911,841
Estimated Annual O&M Costs: Not evaluated.

This alternative involves the excavation of contaminated soils and commingled wastes which exceed the remedial action levels, separation of solid wastes from fines, characterization, removal from the site, subsequent landfill disposal at permitted Subtitle C or Subtitle D landfills and backfilling of the excavated areas with clean soils. MSA estimated that the cost for disposal in a Subtitle C landfill is minimal because any fines exceeding the treatment levels will be treated with a stabilization agent.

This is a viable option because this "dig and haul" remedy is the most effective treatment method of meeting the remedial action levels required for residential development and removal of the waste from the site. Upon excavation of the waste, soil confirmation samples will be collected in the excavated areas to verify that the remedial action levels were achieved.

Alternative 4. In-situ solidification/stabilization (S/S)

Estimated Capital Cost: $ 1,341,665
Estimated Annual O&M Costs: Not evaluated.

This is an in-situ stabilization technology that typically uses auger/caisson systems and injector head systems to add stabilization agents or binders to the contaminated soil or waste without excavation, leaving the resulting material in place. In-situ chemical reagents are mixed with contaminated soils to make use of complex chemical and physical reactions to improve physical properties and reduce contaminant solubility, toxicity, and/or mobility.

This alternative leaves an altered form of waste on site. Due to the huge volume of debris in the soil, the uncertainty to attaining a uniform treatment makes it unsuitable for this site especially for residential development. This technology is expensive. By leaving the resultant material in place, it limits property development and there is a potential health related liability issue.

Alternative 5. Ex-Situ Solidification/Stabilization and Subsequent Disposal

Estimated Capital Cost: $ 1,528,335
Estimated Annual O&M Costs: Not evaluated.

Ex-Situ Solidification/Stabilization reduces the mobility of hazardous substances and contaminants in the environment through both physical and chemical means. Like Alternative 3, this remedy would involve the excavation of contaminated soils and commingled wastes which exceed the remedial action levels, separation of solid wastes from fines, characterization, removal from the site, subsequent landfill disposal at permitted Subtitle C or Subtitle D landfills and backfilling of the excavated areas with clean soils.

Upon excavation, the separated soils would be tested to determine whether they are considered to contain hazardous wastes. Soils exceeding the TCLP standards for hazardous wastes would then be mixed with a stabilization agent in a 1 to 4% ratio of soils to stabilization agent. The S/S process physically binds or encloses contaminants within a stabilized mass. The stabilization agent contains a binding agent such as calcium orthophosphate to permanently bind metals in an insoluble form, as well as buffering agents to ensure that pH remains within prescribed limits to ensure that the stabilized metals remain insoluble under most disposal scenarios. Ex-situ S/S requires excavation of the material to be treated, and the resultant material must be disposed. If excavated soils require treatment prior to disposal, then this option will apply.

Alternative 6. Soil Washing

Estimated Capital Cost: $ 5,525,850
Estimated Annual O&M Costs: $ Not evaluated

Soil washing is a liquid process for scrubbing soils ex-situ to remove contaminants. Aboveground separation and treatment costs for recovered fluids can drive the economics of the process. The amount of debris at this site limits its effectiveness at the Smarthouse Way site.

Alternative 7. Vitrification

Estimated Capital Cost: $ 13,002,000
Estimated Annual O&M Costs: $ Not evaluated

Vitrification uses an electric current to melt contaminated soil at elevated temperatures (1,600 to 2,000°C or 2,900 to 3,650°F). Upon cooling, the vitrification product is a chemically stable, leach-resistant, glass and crystalline material similar to obsidian or basalt rock. The high temperature component of the process destroys or removes organic materials. This technology is expensive and the amount of debris commingled with the soils at the Smarthouse Way site limits its effectiveness.

Alternative 8. Thermal Desorption

Estimated Capital Cost: $ 9,751,500
Estimated Annual O&M Costs: $ Not evaluated

Thermal Desorption is an ex-situ remedial technology that uses heat to physically separate petroleum hydrocarbons from excavated soils. Thermal desorbers are designed to heat soils to temperatures sufficient to cause constituents to volatilize and desorb (physically separate) from the soil. Although they are not designed to decompose organic constituents, thermal desorbers can, depending upon the specific organics present and the temperature of the desorber system, cause some of the constituents to completely or partially decompose. The vaporized hydrocarbons are generally treated in a secondary treatment unit (*e.g.*, an afterburner, catalytic oxidation chamber, condenser, or carbon adsorption unit) prior to discharge to the atmosphere. Afterburners and oxidizers destroy the organic constituents. Condensers and carbon adsorption units trap organic compounds for subsequent treatment or disposal. Due to the huge volume of debris in the soil at the Smarthouse Way site, the uncertainty of attaining a uniform treatment makes it unsuitable for this site.

Alternative 9. Incineration

Estimated Capital Cost: $ 11,376,750
Estimated Annual O&M Costs: $ Not evaluated

Both on-site and off-site incineration use high temperatures to volatilize and combust (in the presence of oxygen) organics in hazardous wastes. While highly effective against organic wastes, incineration has limited applications in addressing metal contaminants such as those present at the Smarthouse Way site. Additionally, economic costs as well as the complexity of obtaining the necessary permits, shakedown operations, and determining safe and effective operating parameters limit the use of this treatment technology.

Alternative 10. Phytoremediation

Estimated Capital Cost: $ Not evaluated
Estimated Annual O&M Costs: $ Not evaluated

Phytoremediation is a process that uses plants to remove, transfer, stabilize, and destroy contaminants in soil and sediment. This is an in-situ remedy employing use of mustard grass, or equivalent local species, to extract and immobilize lead in near surface soils.

This remedy may require post-remedy harvest and disposal of grasses in conjunction with site access restrictions for 3 to 5 years. Time to reach closure is too long. Thus, this remedy is unsuitable for this site.

6. EVALUATION OF THE PROPOSED REMEDY & ALTERNATIVES

The NCP requires that the alternatives for remedial actions be evaluated against nine evaluation criteria. This section summarizes the relative performance of the alternatives by highlighting the key differences among the alternatives in relation to these nine criteria. These nine criteria are categorized into three groups: threshold, balancing, and modifying. The threshold criteria of overall protection of human health and environment and compliance with applicable or relevant and appropriate requirements (ARARs) must be met in order for an alternative to be eligible for selection. The balancing criteria of long term effectiveness and permanence, reduction of toxicity, mobility or volume through treatment, short-term effectiveness, implementability, and cost are used to weigh major tradeoffs among alternatives. The modifying criteria of community acceptance are taken into account after public comment is received on the ADEQ's preferred alternative as identified and described in the draft PDDD. A Detailed Analysis of Alternatives can be found in the PDP.

In addition to the standard criteria for remedy selection, MSA considered a number of site specific criteria, driven by the future development plans for the property. First was the undesirability to leave any wastes in place above health-based screening levels, driven by the plans to redevelop the site as mixed-use high rise condominiums and commercial space, with the primary use being residential. This is the remedial action objective (RAO). In the same manner, inclusion of an institutional control prohibiting digging or excavation on the property was considered unsatisfactory due to the need to establish footings and foundations for the future high-rise building(s).

The criteria considered in the selection of a specific remedy are:

a) ***Overall Protection of Human Health and the Environment*** determines whether an alternative eliminates, reduces, or controls threats to public health and the environment through institutional controls, engineering controls, or treatment.

With the exception of the No Action alternative, all of the proposed remedial actions meet the RAO. Alternative 2 would provide adequate protection from exposure due to direct contact or soil ingestion. However, perpetual cap maintenance and an institutional control containing a no-dig restriction would be required to maintain total protectiveness. Any breach in the cap would potentially expose individuals to existing levels of contamination. Such a restriction would additionally prevent or impair the future development of the site via the construction of mixed-used commercial and residential buildings.

Alternatives 3 and 5 offer the greatest level of protection in that contaminant sources are physically removed from the site.

b) ***Compliance with Applicable, Relevant and Appropriate Requirements*** (ARARs) evaluates whether the alternative meets Federal and State environmental statutes, regulations, and other requirements that pertain to the Site or whether a waiver is justified.

All of the proposed remedial alternatives will meet ARARs if proper handling and monitoring is implemented. All alternatives, except the No Action alternative, had common ARARs associated with the management and ultimate use or disposal of remediation wastes excavated or left in place at the site. Alternative 9, which includes incineration, would be required to meet the performance standards set for incinerators in APC&EC Reg. No. 23, § 264. Acquisition of a permit would not be necessary for on-site treatment operations (equivalent permit conditions would be set forth in the final PDDD), however a permit would be necessary for any surface discharge of treatment water or storm water. A stormwater discharge permit would be necessary for all excavation activities which would affect more than 1 acre of surface area.

c) ***Long-term Effectiveness and Permanence*** considers the ability of an alternative to maintain reliable protection of human health and the environment over time.

The proposed alternatives provide varying degrees of long-term effectiveness and permanence. The effectiveness and permanence of Alternative 2 is entirely dependent upon the adequacy of maintenance. Alternative 3 provides better long term effectiveness in that the source material would be removed from the site. Alternative 5 provides the greatest long-term effectiveness in that contaminant source is not only removed from the site, but would also stabilize the lead, arsenic and cadmium contamination in the removed soil. With the exception of Alternatives 3 and 5, reviews at least every five years would be required to evaluate the effectiveness of any of these alternatives, since contaminants would remain on-site.

d) ***Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment*** evaluates an alternative's use of treatment to reduce the harmful effects of principal contaminants, their ability to move in the environment, and the amount of contamination present.

Alternatives 1 and 2 do not include treatment as a component of the remedy. Therefore, these alternatives would not reduce the toxicity, mobility, or volume of contamination at the site. Alternative 3 reduces the volume and mobility of the contaminants by removing them from the site. Alternatives 4, 6, 7, 8, 9, and 10 reduce the mobility and toxicity of contaminants by varied means of treatment, but in each case wastes would be left in place on the site. Alternative 5 offers the best abatement of mobility and toxicity in that contaminants are physically removed from the site, while the metals are stabilized by being bound by the orthophosphate treatment agent, with the intent to reduce their availability below the limits for TC-characteristic wastes.

e) ***Short-term Effectiveness*** considers the length of time needed to implement an alternative and the risks the alternative poses to workers, residents, and the environment during implementation.

With the exception of the No Action Alternative, Alternative 3 provides the shortest time frame for implementation at 3 months. In ascending order, Alternative 2 (3.5. months), Alternative 4 (4 months) and Alternative 5 (4 to 5 months) offer the next shortest time frames to completion. Alternative 9

(incineration) offers the longest term (3 to 5 years) because of the time needed to construct, shake down, and obtain the necessary permits and operating parameters for the incinerator unit. In all alternatives, there are some potential short-term risks to site workers from contaminant exposure during excavation. For all of the alternatives, standard health and safety procedures will reduce potential exposure risks.

f) ***Implementability*** considers the technical and administrative feasibility of implementing the alternative, such as relative availability of goods and services.

Alternative 2 is easily implemented through the ready availability of soils for capping and industry familiarity with the process. Alternative 3 is easily implemented; however, there is no Subtitle C landfill available in Arkansas, therefore contaminated material will be transported out of state with greatly increased disposal and transportation costs. Alternative 5 is easily implemented in the same manner as Alternative 3, with the addition that the orthophosphate-based treatment agent is inexpensive, readily available, and effective to the point where most of the fine soils excavated can be treated and reused as either daily cover in a waste disposal facility or disposed in a Subtitle D landfill. The required institutional controls for Alternatives 2, 4, and 6 through 10 can be readily implemented on site.

g) ***Cost*** includes estimated capital and operation and maintenance costs as well as present worth costs. Present worth cost is the total cost of an alternative over time in terms of today's dollar value. Cost estimates are expected to be accurate within a range of +50 to -30 percent.

MSA did not provide a detailed cost analysis for each alternative considered in the PDP, but provided general costs for most alternatives based on a basis of per ton of wastes treated. These estimates were used with the estimate of the amount of remediation waste to be addressed (32,505 tons) and general comparative costs were derived for each alternative. The estimated construction costs for the alternatives, not including the No Action alternative, range from $504,274 to approximately $13 million. The cost of each alternative increases as the degree of soils treatment increases.

h) ***State Acceptance*** considers whether the State agrees with the MSA analysis and recommendations of the CSA and the PDP.

ADEQ expresses its support for Alternatives 3 and 5. ADEQ does not support Alternative 1 (No Action) because it does not provide adequate protection for human health and the environment.

Alternative 2 (Isolation/Containment) is not favored because it does not use treatment as a permanent solution. During implementation of the CSA and preparation of the PDP, MSA has coordinated with the ADEQ. ADEQ has approved the Comprehensive Site Assessment, and concurs in principle with the, PDP which are the supporting reports used to present the preferred remedial alternative. ADEQ appreciates that the detailed remediation plans that would routinely be required at this stage of the process are not yet available, and will not be available until MSA procures a remedial action contractor. However the ADEQ also understands and concurs with the remedial objective to remove all impacted soils and debris which exhibit levels of the constituents of concern above the EPA Region 6 residential HHMSSLs. It is ADEQ's intent to approve the general scope of remediation work proposed by MSA in the revised PDP subject to the submittal and prior approval by the ADEQ of detailed work plans once a remedial action contractor has been procured for the design and implementation of these remedial actions.

i) *Community Acceptance* considers whether the local community agrees with the ADEQ's analyses and preferred alternative. Comments received on PDDD are an important indicator of community acceptance.

Community acceptance of the preferred alternative will be evaluated after the public comment period ends and will be described in the Response to Comments and final PDDD for the site

7. PROPOSED/RECOMMENDED REMEDIES

The primary RAO is to make the site suitable for unrestricted use and unrestricted exposure to any remaining contaminants. MSA proposes to achieve this goal by meeting the EPA Region 6 Residential HHMSSL for residential land use and not leaving impacted soil exceeding those levels on site. Remedial Alternatives 4, 6, 7, 8, and 9 were not considered feasible due to cost effectiveness. Alternatives 1, 2, and 4 leave waste exceeding HHMSSL on site. The uncertainty of cleanup efficiency of Alternatives 4, and 8 bring into question their effectiveness and time constrains make Alternative 10 not feasible.

Based on the evaluation of all the alternatives considered, Alternative 3, Waste Excavation, Characterization and Subsequent Landfill Disposal and Alternative 5, Ex-Situ Solidification/Stabilization and Subsequent Disposal are the preferred remedies which are economically feasible and will comply with the selected cleanup goals for the redevelopment of the property.

8. REMEDIAL ACTION LEVELS

Based upon the soil analytical results reported in the CSA and the pre-remedial design data collection and analysis phase, the primary chemicals of concern at the site include metals (specifically lead, arsenic and cadmium), PCBs, benzo(a)pyrene, asbestos and TPH-DRO.

Other metal constituents detected in soils at the site with elevated concentrations include aluminum, antimony, arsenic, cadmium, copper and iron; however, the existing data from the CSA and the pre-remedial design and data collection and analysis phase indicates that elevated metals concentrations on the Smarthouse Way site consistently occur in the presence of elevated concentrations of lead, cadmium and/or arsenic. Low concentrations of insecticides were also detected at limited areas of the site (with all of the detections occurring within a depth of 7-inches below ground surface (bgs) and within areas of the site which will be remediated). Based on soil samples collected during the preremedial design collection phase, the average depth of impact to soil is estimated to be approximately 2.6 feet bgs and appears to occur primarily within non-native fill material.

The property will be developed as mixed use high-rise condominiums and retail/office space with the intended use of the property considered residential in nature. Therefore, with the exception of arsenic and TPH-DRO, the EPA HHMSSL for a residential setting are proposed to be used at the site as the minimum cleanup/remediation levels.

Arsenic often occurs naturally in soils at concentrations above the HHMSSL in this region. Based on soil sample results collected during the CSA on the Smarthouse Way (North Tract) property, a background concentration of 6.4 mg/kg was proposed to ADEQ and approved for utilization as the site-specific cleanup criteria for arsenic at the site.

There is no established HHMSSL for TPH-DRO. A concentration of 100 mg/kg is employed as the site specific cleanup criteria for TPH-DRO. ADEQ has typically used 100 ppm total TPH as a cleanup level for site-related spills and/or releases. This is not a risk-based concentration, nor is it a fixed standard; rather, it is a baseline value for use as an action level.

A summary of the proposed cleanup/remediation action levels is presented below in Table 1.

Table 1
Proposed Remedial Action Levels
Smarthouse Way

Constituent	Remedial Action Level (mg/kg)
Lead	400
Arsenic	6.4
Cadmium	39
PCBs	0.22
Benzo(a)Pyrene	0.062
TPH-DRO	100

9. SELECTED REMEDY/SITE PLAN

Based on the preceding comparisons, ADEQ proposes Alternatives 3 and 5 as the final remedy for the Smarthouse Way site. The proposed remedy is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost effective. The proposed remedy uses permanent solutions and alternative treatment or resource recovery technologies, to the maximum extent practicable, and satisfies the statutory preference for remedies that use treatment that reduces toxicity, mobility, or volume as a principal element.

Of the five balancing criteria, long-term effectiveness and permanence and reduction of toxicity, mobility, or volume, and short-term effectiveness are the criteria that influenced the proposal of Alternatives 3 and 5 as the preferred remedial alternatives.

At the time the PDP was submitted for approval, MSA had not procured a consulting engineer for remedial design or remedial action for the selected remedy at the Smarthouse Way site. ADEQ appreciates that the detailed remediation plans that would routinely be required at this stage of the process are not yet available, and will not be available until MSA procures a remedial action contractor. However the ADEQ understands – and concurs with – the remedial objective to remove all impacted soils and debris which exhibit levels of the constituents of concern above the EPA Region 6 HHMSSLs. It is ADEQ's intent to approve the general scope of remediation work proposed by MSA in the PDP subject to the submittal and prior approval by the ADEQ of detailed work plans once a remedial action contractor has been procured for the design and implementation of these remedial actions.

Prior to the initiation of remedial actions or other construction activities at the Smarthouse Way site, MSA shall prepare and submit for ADEQ approval the following remedial action plans and supporting documents:

i) Construction Plans and Specifications

This draft PDDD is intended to present a remedial clean-up strategy which will permit redevelopment of the site and subsequently obtain approval from the ADEQ Brownfields Program. Upon completion of the clean-up activities, it is anticipated that soils on the property will not exceed the EPA Region 6 HHMSSL's for residential habitation which will permit redevelopment of the property in an unrestricted manner. However, any form of groundwater use will be restricted via an institutional control placed on the property deed.

Site specific remedial design plans for the site have not been generated to date. The contractor selected to perform this work will be required to submit a site-specific grading plan, the excavation plan, the remedial design plan and their respective specifications. No work covered by the PDP and the PDDD shall begin until ADEQ has reviewed and approved all the relevant plans and specifications. All remedial design engineering documents shall be signed and stamped or embossed by a professional engineer registered in Arkansas.

ii) Health and Safety Plan and Quality Assurance Project Plan

The following sections discuss the general cleanup strategy, excavation activities, treatment methods (if needed), characterization and disposal of waste, and method of confirming that the contaminated soil is successfully removed. The contractor selected to perform this work will be required to submit a site-specific Health and Safety Plan (HSP) and Quality Assurance Project Plan (QAPP). The HSP and QAPP shall be submitted as an addendum to the PDP. No work covered by the PDP and PDDD shall begin until ADEQ has reviewed the HSP and QAPP.

iii) Storm Water Discharge Permit

A National Pollutant Discharge Elimination System (NPDES) General Storm Water Permit from the ADEQ shall be obtained by MSA prior to the initiation of the construction activities. A Storm Water Pollution Prevention Plan (SWPPP) will be submitted to ADEQ for approval along with the required Notice of Intent at least two weeks prior to the start of construction/remediation activities.

All storm water shall be diverted away from recently exposed fill material and S/S remedial operations. The diverted storm water shall be directed to a discharge point into the City of North Little Rock storm water collection system.

The City of North Little Rock Waste Water Utility will be provided a copy of the soil analytical results. At the time of the publication of this PDDD, the specific requirements for the storm water discharge permit were under consideration. A sampling plan, if required, will be submitted to the ADEQ along with the SWPPP.

Construction/remediation activities may not begin until the requirements of the SWPPP have been met and a notice to proceed granted by ADEQ.

iv) Excavation Activities

It is anticipated that soils excavation activities will generally begin in areas exhibiting lead concentrations above 400 ppm and arsenic contamination above 6.4 ppm. Excavation will be carried out in phases. MSA will submit to ADEQ an excavation plan identifying the grids to be excavated in the first phase and subsequent phases of excavation with anticipated completion dates.

Activities at the site will consist of separation of newly generated solid waste from fines. Stockpiling of newly generated solid waste and fines in separate areas of the site. Testing newly generated solid waste and fines to determine their individual status (contamination levels); treatment and removal or removal without treatment; confirmation testing of excavated areas; backfilling as needed and site closure. If asbestos is encountered during the excavation it will be handled and disposed of properly.

Excavation activities will be conducted by utilizing backhoes/trackhoes and open-top dump trucks to remove and place excavated soils and newly generated solid waste within a pre-defined area of the site. Excavated material will not be placed within any area of the site in which no constituent impact to soil was observed. The area in which the excavated materials will be placed will be lined with plastic visqueen. The excavated materials will subsequently be covered with visqueen. The general depth of excavation across each grid will be based on the depth of impact to soil as identified in the excavation plan, as well as visual observations of stained or obviously contaminated material encountered during excavation.

v) Screening and Disposal of Materials

The excavation contractor shall remove adhering clumps of residuals from any newly generated construction and demolition (C&D) material. All newly generated C&D waste will be carefully screened by a trained individual to ensure that the material does not contain a regulated waste. Items not acceptable include asbestos containing material (ACM), lead based paint items (LBP), batteries, treated wood, PCB containing material, petroleum contaminated soil and miscellaneous items (thermostats, fluorescent light ballasts, etc). Composite samples will be collected from the C&D stockpile and analyzed for the constituents listed as the treatment standards.

The levels at which excavated soils will be determined to no longer contain hazardous waste, and thus be eligible for disposal in a RCRA Subtitle D (solid waste) landfill are presented in Table 2 below.

Table 2
Treatment Standard for Disposal of Impacted Soils
In Subtitle D Landfill

Constituent	**Treatment Standard**
Lead	< 5.0 mg/L TCLP
Arsenic	< 5.0 mg/L TCLP
Cadmium	< 1.0 mg/L TCLP
PCBs	< 50 mg/kg

While benzo(a)pyrene was found at the site at levels exceeding the HHMSSLs, close review of the site history as presented in the Phase I and Comprehensive Site Assessments do not indicate any history of disposal of listed wastes containing this compound as an underlying hazardous constituent since the mid-1980s, when such substances were banned from land disposal. In consideration of sampling results for these contaminated soils in situ (while they remain in the land), ADEQ has determined that the presence of benzo(a)pyrene does not indicate that these soils contain a listed hazardous waste, and as such are not subject to the land disposal restrictions under Regulation No. 23 § 268. (The land disposal restrictions do not attach to environmental media (e.g., soils) contaminated by hazardous wastes when the wastes were placed before the effective dates of the applicable land disposal prohibitions. If these media are determined not to contain hazardous wastes before they are removed from the land, then they can be managed as non-hazardous contaminated media and are not subject to the RCRA land disposal

restrictions. See 61 FR 18805, April 29, 1996, and 60 FR 66344, December 21, 1995.) Likewise, soils contaminated with TPH-DRO do not contain listed or characteristic hazardous wastes, and are not subject to the LDRs. However, management and disposal of these contaminated hazardous media remain subject to the provisions of APC&EC Regulation No. 22 (Solid Waste Management).

Following characterization, the excavation contractor shall initiate removal of the impacted material with the backhoe/trackhoe. The equipment operator will load the impacted material directly into haul trucks or roll-off boxes for transportation directly to the disposal facility. The excavation contractor shall remove adhering clumps of residuals from trucks and tires at the load area. Extraneous residuals will not be permitted to leave the area.

The excavation contractor shall use due care when transferring contaminated material from stockpiles to the transport vehicle. Should releases of contaminated material to the environment occur that are visible, the Contractor shall clean up spilled material and place in transport vehicle. The contractor will implement dust control measures at all times to prevent airborne dust in handling and loading materials. If water is used in the control method, residuals will not be saturated to a point where they will generate free liquid and prevent transport or receipt at the disposal facility. Slow movement of equipment and low bucket dump heights will reduce the potential for off-site migration of contaminated dusts.

vi) Soil Stockpile Composite Sampling

In order to characterize the excavated soil stockpiles, a systematic grid will be established across the stockpile. Grab samples will be collected at several locations across the stockpile utilizing the grid system and a composite sample prepared. Each grab sample will be homogenized into a single composite sample to better represent a large quantity of soil. Homogenization is the mixing or blending of a soil sample in an attempt to provide uniform distribution of contaminants. The grab samples will be manually homogenized using a stainless steel spoon or scoop and a stainless steel bowl.

vii) Soil Solidification/Stabilization

Contaminated soils and C&D waste which require treatment prior to disposal must meet treatment standards as outlined herein.

The treatment standards have been established based upon regulatory criteria. Regulatory and toxicity characteristic leaching criteria are applicable standards for the soils and C&D waste.
Contaminated soil and C&D waste which cannot be treated to meet the treatment goals will be disposed of in a Subtitle C landfill if accepted by the landfill.

The proposed remediation of the soil would consist of ex-situ soil solidification/stabilization (S/S) treatment which is designed to reduce the mobility of hazardous substances and contaminants in the material through both physical and chemical means. The S/S process physically binds or encloses contaminants within a stabilized mass, thus allowing the treated material to be disposed within the requirements of a RCRA Subtitle D Landfill.

The recommended S/S treatment method will consist of ex-situ mixing of the soil with a specified reagent. MSA has contacted and is currently soliciting bids from three (3) remediation contractors specializing in heavy metals treatment technologies. The remediation firms are currently conducting treatability studies on soil collected from the Smarthouse Way in order to provide a tailored stabilization formula that is optimized for the site-specific waste stream.

The proposed S/S treatment will consist of initially separating the fine grained soil from larger particles and debris and properly mixing and processing contaminated soil with a reagent. It is the goal of this effort to produce a final stabilized material that meets specified treatment standards. All treated soils will be placed on plastic visqueen and covered with visqueen until subsequent disposal. The remediation contractor will implement dust control measures at all times to prevent airborne dust in handling and loading materials.

viii) Transportation of Waste Materials

The excavated waste materials shall be as required by regulations manifested and transported to permitted landfills in tarp covered trucks or containers. The manifest will include the following information:

- Generator name and address
- Transporter company name
- USEPA identification number (if applicable)
- Designated facility name and site address
- US Department of Transportation (DOT) description (shipping name, hazard class, and ID number)
- Total waste quantity

MSA (or MSA's designated agent) and the transporter will sign the manifest and a copy of the manifest retained before departure from the site. The transporter will retain the original manifest during transport. The manifest will remain in the truck at all times during transport to the landfill. Upon arrival at the disposal facility, a landfill representative will sign the manifest to verify the final destination of the residuals. Copies of all manifests signed by the landfill will be provided to MSA and maintained in the project file.

Upon arrival at the disposal facility, trucks will be weighed to determine the final amount of residuals disposed. The disposal facility will generate copies of the scale tickets and provide them to MSA. It is anticipated that traffic control measures will be implemented during disposal activities. These controls will be utilized to minimize disruption to local traffic routes and to encourage safe transportation practices.

ix) Disposal at Permitted Landfills

The soil stockpiles will be re-sampled for constituents as required by ADEQ and the Solid Waste Disposal Facility (SWDF). Each SWDF has its own disposal rules and requirements. The SWDF will determine the type and frequency of laboratory testing required in order to demonstrate that material removed from the site is not a hazardous waste. As a guide, ADEQ recommends one sample for every 200 cubic yards of soil. Composite sample methodology from the newly generated C&D material stockpiles will also be determined by the SWDF. After the stockpile confirmation sampling, the soils will be transported and disposed at the appropriate SWDF as discussed below:

Non-hazardous Soil

It is anticipated that all non-hazardous soil will be disposed of at the Waste Management Subtitle D Class 1 SWDF located in Jacksonville, Arkansas (Two Pine Landfill).

Non-hazardous Solid Waste
It is further anticipated that all newly generated solid waste that can be classified as C&D waste, as defined in *ADEQ Regulation 22 – Solid Waste Management Rules*, will be disposed at the City of North Little Rock Class 4 SWDF located in North Little Rock, Arkansas.

Class 4 wastes include non-hazardous, bulky, inert, non-putrescible solid wastes that do not degrade, or degrade very slowly and are permitted by the ADEQ will be disposed of in a Class 4 landfill. Class 4 materials may include bricks, concrete blocks, concrete, metal and glass.

Hazardous Soil and Solid Waste
In the event that composite sample results indicate that concentrations exceed the treatment standards (or other constituents at concentrations which would prohibit disposal as determined by the disposal facility), treatment of the soils would be required. The proposed remediation of the soil would consist of ex-situ soil solidification/stabilization (S/S) treatment. Once the waste meets treatment standards it can be disposed of as non-hazardous waste.

If after S/S the composite sample results indicate that concentrations exceed the treatment standards, it needs to be disposed of at a Subtitle C landfill. It is anticipated that all hazardous soil will be disposed of at the Chemical Waste Management Landfill, Lake Charles in Louisiana.

x) Grid Confirmation Sampling Before Backfilling
Upon excavation of the impacted material to the estimated depth, at least one confirmation sample will be collected within the bottom of each 50 foot by 50 foot square grid to verify that the remedial action levels were achieved. Confirmation samples will be obtained within each established grid by collecting a minimum of one (1) surface grab sample (following the actual removal of the contaminated soil) for subsequent laboratory analysis. The confirmation sample results, along with existing laboratory analytical data, will be evaluated to confirm that the site, as a whole, has been remediated to the HHMSSLs required for residential redevelopment.

For example, one (1) grab confirmation sample will be collected within each grid once excavation to the total depth has occurred. The existing laboratory data surrounding the grid (at the corner intersect of each 50 foot by 50 foot grid) will also be employed to confirm that all constituents of concern extant above the remedial action levels have been removed. Utilizing this method, laboratory analytical data from a minimum of 5 discrete sample locations per 50 foot by 50 foot grid will be utilized as confirmation sample results.

Each confirmation sample will be analyzed for the constituents as presented in TABLE 1 (total concentrations). Should any of the individual constituents detected in the discrete sample exceed the remedial action levels, additional excavation of soils within that grid will be performed and the area of concern re-tested until it is determined that the impacted material has been removed. Once the grids are confirmed to have met the clean up goals, it will be backfilled with documented clean soil. MSA will inform ADEQ of the source of the borrow materials. If the backfill materials are suspected to be contaminated, ADEQ can request MSA to verify that the borrow materials are clean through sampling.

Additional information regarding the confirmation sampling program will be included in a Sampling and Analysis (SAP) plan to be submitted to the EPA and ADEQ prior to

excavation activities. QA/QC samples will be collected during the confirmation sampling activities in accordance with the SAP as a component of the Quality Assurance Project Plan (QAPP), EPA and ADEQ requirements.

xi) Placement of an Institutional Control

As a result of the former land uses at the Smarthouse Way and the demonstrated existence of high concentrations of chemicals of concern in groundwater at the site and in order to protect human health MSA will implement an Institutional Control (IC) to prevent future ground water use from the aquifer through a restriction on the installation of wells for the purpose of withdrawing water from the aquifer. This IC will consist of one of the following:

1) MSA will be required to file an easement or other environmental use restriction in the property's record of title. Such easement shall run with the land and grant right of access for activities related to implementing the selected remedy. A deed notification shall be filed with the appropriate land records office. The deed notification would state that the property is located within a Brownfields site and identify the kinds of contaminants present in the groundwater and describe activities that should not be conducted at the site.

2) The establishment of a city and/or county ordinance which restricts the use of groundwater in the same manner as the deed restriction described above.

xii) Notice to Proceed

A notice to proceed will be issued to MSA upon the review and/or approval of all of the following plans, specifications and project documents as shown in the Table 3 below. Construction/remediation activities will not begin until the notice to proceed is granted by ADEQ.

Table 3
List of Required Plans and Specifications

Plans and Specifications	Date review/approved
1) a site-specific grading plan and specifications	A
2) an excavation and backfilling plan and specifications	A
3) a construction plan and specifications	A
4) a storm water pollution prevention plan	A
5) a site-specific health and safety plan	R
6) a site-specific quality assurance project plan	R

Note: A = approval by ADEQ required
R = review by ADEQ required

10. EFFECTIVENESS MONITORING PROGRAM

The selected remedy for the Smarthouse Way site will not leave contamination in place which exceeds health-based levels allowing unrestricted use of the property or unrestricted exposure to any remaining contaminants at the property. It is anticipated that the existing contaminated soils above the remedial action levels will be removed from the site. The site will be covered by a new building(s), parking lots,

landscaped areas and clean fill as needed. Therefore, post-construction monitoring, operation and maintenance activities, or a five-year review process is not anticipated to be required.

11. COORDINATION WITH OTHER DIVISIONS/AGENCIES

It is important to involve/inform other divisions of ADEQ and other agencies as applicable, in the development of a PDDD. To keep EPA informed of all remedial action work, EPA Region 6 was provided a copy of the Public Notice and draft PDDD for review and comment.

INTERNAL COORDINATION

ADEQ Divisions	Consulted/Informed	Sent Notice of Decision
Water	No	Yes
NPDES	No	No
Air	No	Yes
Solid Waste	Yes	Yes
Regulated Storage Tanks	No	No
Environmental Preservation And Technical Services	No	No
Mining	No	No

EXTERNAL COORDINATION

Other State and Federal Organizati	Consulted/Informed	Sent Notice of Decision
U.S. EPA, Region 6	Yes	Yes
AR Office of Emergency Services	No	No
AR Dept. of Health & Human Services	No	Yes
AR State Clearinghouse	No	No
AR State Historic Preservation	No	No
AR Natural Heritage Commission	No	No
AR Game & Fish Commission	No	No
U.S. Army Corps of Engineers	No	Yes

The draft PDDD will also be sent to all applicable branches of the Hazardous Waste Division, and to all relevant divisions and agencies listed above.

--- End of PDDD. ----